

**AMENDMENTS TO THE CLAIMS:**

Claims 2-5, 10, 12, 14, 16, 19-23, 26-28, 31, 33-35, 37, 38, 40-42, 44-50, 53-57, 59, 61-91, 94-96, 99-102, 104-111, 113 and 115 are cancelled without prejudice. Please amend claims 1, 6, 7, 9, 11, 13, 15, 17, 18, 24, 25, 29, 30, 32, 39, 39, 43, 51, 52, 58, 60, 92, 93, 97, 98, 103, 112, and 114 as follows:

1. (**Currently Amended**) Method of manufacturing a metal and/or semi-metal compound such as metal and/or semi-metal oxides, metaloxy and/or semi-metaloxy hydroxides metal and/or semi-metal hydroxides, metal and/or semi-metal carbides, metal and/or semi-metal nitrides, metal and/or semi-metal carbonitrides, metal and/or semi-metal borides, electroceramics and other such compound, said compound having a sub-micron primary particle size, comprising the steps of:  
- introducing a solid reactor filling material in a reactor,  
- introducing a metal- and/or semi-metal- containing precursor or a substitution source in said reactor,  
- introducing a reactant into said reactor,  
- introducing a supercritical solvent into the said reactor, thereby  
- establishing a contact between the metal- and/or semi-metal- containing precursor and the co-solvent, thus  
- resulting in the formation of said compound in the proximity of the said solid reactor filling material.

Claims 2-5. (**Cancelled**)

6. (**Currently Amended**) Method according to any of claims 1-5, wherein the formation of said compound takes place by a process involving at least a sol-gel reaction.

7. (**Currently Amended**) Method according to claim 1 or claim 3, wherein the metal and/or semi-metal compound is/are substantially crystalline.

8. (**Cancelled**)

9. (*Currently Amended*) Method according to claim 1 or claim 3, wherein the metal and/or semi-metal compound is/are substantially amorphous.

10. (*Cancelled*)

11. (*Currently Amended*) Method according to claim 1, wherein the metal and/or semi-metal compound is/are a mixture of several different phases.

12. (*Cancelled*)

13. . (*Currently Amended*) Method according to any of claims 1 or 3 and any of claims 5-12-5, wherein the introduction of the solid reactor filling material, the metal-containing precursor, alternatively the semi-metal precursor, the possible co-solvent, and the supercritical solvent into the said reactor is done in arbitrary order.

14. (*Cancelled*)

15. (*Currently Amended*) Method according to any of claims 1 or 3 and any of claims 5-145, wherein at least one of the solid reactor filling material, the metal-containing precursor, alternatively the semimetal-containing precursor, the possible co-solvent or the supercritical solvent is mixed with at least one of the solid reactor filling material, the metal-containing precursor, alternatively the semi-metal-containing precursor, the possible co-solvent or the supercritical solvent before introduction into the said reactor.

16. (*Cancelled*)

17. (*Currently Amended*) Method according to any of claims 1 or 3 and any of claims 5-165, where the reactant comprises at least one of the following components: water, ethanol, methanol, hydrogenperoxid and isopropanol.

18. (**Currently Amended**) Method according to any of claims ~~1-or 3 and any of~~ claims ~~5-175~~, where the substitution source comprises at least one of the following components: carbon, nitrogen, boron and/or any combination of these.

Claims 19-23. (**Cancelled**)

24. (**Currently Amended**) Method according to any of claims ~~1-205~~, wherein a temperature in the reactor during the formation of said compound is performed at a temperature profile being an arbitrary combination at least two of the temperature profiles: a fixed temperature, an increasing temperature, a decreasing temperature.

25. (**Currently Amended**) Method according to ~~any of~~ claims ~~21-24~~10, wherein the temperature in the reactor during the formation of said compound is maximum 400°C, more preferably maximum 300°C, even more preferably maximum 200°C, most preferably maximum 100°C, and even and most preferably maximum 50°C.

Claims 26-28. (**Cancelled**)

29. (**Currently Amended**) Method according to any of claims ~~26-28-1-5~~, wherein a pressure in the reactor during the formation of said compound is performed at a pressure profile being an arbitrary combination at least two of the pressure profiles: a fixed pressure, an increasing pressure, a decreasing pressure.

30. (**Currently Amended**) Method according to any of claims ~~1-295~~, wherein the supercritical solvent is CO<sub>2</sub>, and wherein the pressure in the reactor during the formation of said compound is minimum 74 bar, more alternatively minimum 80 bar, even more alternatively minimum 90 bar, and most alternatively minimum 100 bar and wherein the temperature in the reactor during the formation of said compound is minimum 31°C, alternatively 43°C, alternatively minimum 100°C, alternatively minimum 200°C, alternatively minimum 300°C, alternatively minimum 400°C alternatively minimum 500°C, alternatively minimum 600°C, alternatively minimum 700°C, alternatively minimum 800°C.-

31. (*Cancelled*)

32. (*Currently Amended*) Method according to any of claims 1-295, wherein the supercritical solvent is isopropanol, and wherein the pressure in the reactor during the formation of said compound is minimum 47 bar, more alternatively minimum 80 bar, even more alternatively minimum 90 bar, and most alternatively minimum 100 bar and wherein the temperature in the reactor during the formation of said compound is minimum 235°C, more alternatively minimum 250°C, even more alternatively minimum 270°C, most alternatively minimum 300°C, and even and most alternatively minimum 400°C.

Claims 33-35. (*Cancelled*)

36. (*Currently Amended*) Method according to any of claims 1-35, wherein the time of the formation of said compound is maximum 1 hour, preferably maximum 0.75 hour, and most preferably maximum 0.5 hour.

37. (*Cancelled*)

38. (*Cancelled*)

39. (*Currently Amended*) Method according to any of claims 1 or 3 and any of claims 5-38 -5 wherein a plurality of different metal- and/or semi-metal- containing precursors is/are introduced in said reactor.

Claims 40-42. (*Cancelled*)

43. (*Currently Amended*) Method according to any of claims 1-or 2 and any of claims 5-42 -5, wherein the metal containing or semi-metal containing precursor is a metal alkoxide or a semi-metal alkoxide.

Claims 44-50. (*Cancelled*)

51. (*Currently Amended*) Method according to any of claims 5-50, 2-5, wherein the co-solvent is selected from the group of: water, ethanol, methanol, hydrogenperoxid and isopropanol.

52. (*Currently Amended*) Method according to any of claims 5-51, 2-5, wherein a plurality of different co-solvents is introduced in said reactor.

Claims 53-91. (*Cancelled*)

92. (*Currently Amended*) Method according to any of claims 1-91, 1-5, wherein the solid reactor filling material comprises any combination of metal oxide, semi-metal oxide, metal oxidhydroxide, semimetal oxidhydroxide, metal hydroxide, semi-metal hydroxide, metal carbide, semi-metal carbide, metal nitride, semi-metal nitride, metal carbonitride, semi-metal carbonitride, metal boride and semi-metal boride identical to at least one compound resulting from the formation in said reactor.

93. (*Currently Amended*) Method according to any of claims 1-92, 1-5, wherein the solid reactor filling material functions as seed material for the formation of said compound and/or as a collecting agent for the said compound.

Claims 94-96. (*Cancelled*)

97. (*Currently Amended*) Method according to any if claims 1-96, 1-5, wherein said compound is separable from the solid reactor filling material in a way that allows the solid reactor filling material to be reused as solid reactor filling material.

98. (*Currently Amended*) Method according to any of claims 1-97, 1-5, wherein said compound is separable from the solid reactor filling material by flushing the solid reactor filling material in a fluid or by vacuum means or by blowing means or by ultrasonic means.

Claims 99-102. (*Cancelled*)

103. (*Currently Amended*) Metal compound such as metal and/or semi oxide, metal and/or semi oxidhydroxide, metal and/or semi hydroxide, metal and/or semi carbide, metal and/or semi nitride, metal and/or semi carbonitride or metal and/or semi boride compound being manufactured by the method according to any of claims ~~1-101~~, 1-5, wherein the metal and/or semi oxide, metal and/or semi oxidhydroxide, metal and/or semi hydroxide, metal and/or semi carbide, metal and/or semi nitride, metal and/or semi carbonitride or metal and/or semi boride compound is in the form of aggregates of primary particles with an average primary particle size of 100 nm, preferably maximum 50 nm, more preferably maximum 20 nm, and most preferably maximum 10 nm.

Claims 104-111. (*Cancelled*)

112. (*Currently Amended*) Apparatus for manufacturing a metal and/or semi-metal compound such as metal and/or semi-metal oxides, metaloxy and/or semi-metaloxy hydroxides metal and/or semi-metal hydroxides, metal and/or semi-metal carbides, metal and/or semi-metal nitrides, metal and/or semi-metal carbonitrides, metal and/or semi-metal borides, electroceramics and other such compound, said compound having a sub-micron primary particle size, comprising the following components:

- means for introducing a solid reactor filling material in a reactor,
- means for introducing a metal- and/or semi-metal- containing precursor in said reactor,
- means for introducing a reactant in said reactor,
- means for introducing a supercritical solvent into the said reactor,
- said reactor intended as a space for establishing a contact between the metal- and/or semi-metal- containing precursor and the reactant and
- said reactor intended as a space for the formation of said compound in the proximity of the said solid reactor filling material.

113. (*Cancelled*)

114. (*Currently Amended*) Apparatus for manufacturing a metal and/or semi-metal compound such as metal and/or semi-metal oxides, metaloxy and/or semi-metaloxy hydroxides, metal and/or semi-metal hydroxides, metal and/or semi-metal carbides, metal and/or semi-metal nitrides, metal and/or semi-metal carbonitrides, metal and/or semi-metal borides, electroceramics and other such compound, said compound having a sub-micron primary particle size, comprising the following components:

- means for introducing a solid reactor filling material in a reactor,
- means for introducing a metal-and/or semi-metal- containing oxide in said reactor,
- means for introducing a substitution source in said reactor,
- means for introducing a supercritical solvent into the said reactor,
- said reactor intended as a space for establishing a contact between the metal-and/or semi-metal- containing oxide and the substitution source and
- said reactor intended as a space for the formation of said compound in the proximity of the said solid reactor filling material.

115. (*Cancelled*)